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The following is a report on observations made during the academic year 1960-61 while the author was engaged in study and research at the Institute of Reproductive Physiology and Pathology of the Veterinary College of Norway, Oslo. This activity was supported by a North Atlantic Treaty Organization Postdoctoral Fellowship under the direction of the National Science Foundation. A number of such fellowships are awarded each year in all areas of science to foster the understanding and exchange of information between scientists of the North Atlantic Treaty countries and to encourage the scientific careers of young men in the various fields of science.

Veterinarians have been trained and educated in Norway since 1934. Before this time there was an active institute for diagnosis, serum production and research, but students of veterinary medicine were trained in Sweden, Denmark and other European schools.

Teaching and research are carried out in eleven scientific departments, each of which is operated by a professor and a staff of assistants. In addition to this there is a research farm, diagnostic laboratory, serum institute and complete veterinary medical library with a staff of three full time librarians.

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The Veterinary College (Fig. 1) is under the direct authority of the Ministry of Agriculture and is administered by a board of directors appointed by the government. The Rector or Dean, who must be one of the professors of the college, is the chairman of the Teachers Committee which consists of all the professors of the different departments. At the present time Professor H. F. Wirstad, Head of the Surgery Department, is the Dean. The Teachers Committee deals with current problems as they arise.

The students coming into the veterinary college are 19-20 years of age or older and have graduated from Gymnasium. They must have good records in mathematics, physics, chemistry and biology. Most of the students have followed the modern line of study and have a good reading knowledge of English and German. A few who have followed the classical line must have a good background in science as well. As the students enter the Veterinary College they have the equivalent of 1 or 2 years of college or junior college in the United States. There are many more students applying for admission than can be accepted. An average group of 20 new students is taken in each September. There are usually one or two girl students in each class.

The basic theoretical subjects taught are anatomy, histology, biochemistry, physiology, pharmacology and general pathology.

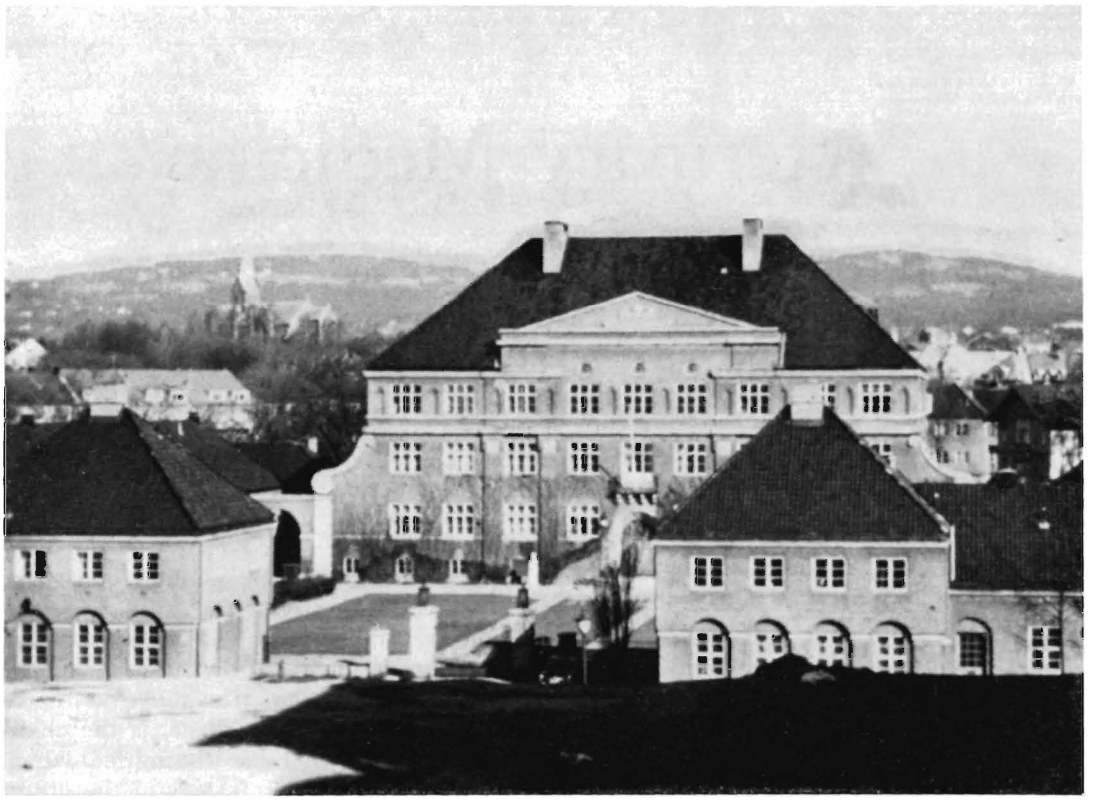

Fig. 1. The Veterinary College of Norway. The large building in the center contains the administration offices and some of the basic science class rooms and laboratories. The medicine clinic is on the left and the surgery clinic is on the right.

When the student has completed this section of the work, which requires about 2 years, he takes the intermediate examinations. After this the more practical veterinary subjects are studied such as bacteriology, parasitology, pathological anatomy, food hygiene, genetics, breeding, veterinary hygiene, surgery, medicine, obstetrics, reproductive physiology and pathology. Teaching in these subjects takes about 3 years. The student is then ready for his veterinary examination, though many students wait 1-2 years after the end of lectures and clinics before presenting themselves for examination.

The total period of instruction at the college is 5 years. Some students finish in the minimum time, but many take 6 to 7 years for their studies. The student is examined individually in each subject and has the right to decide when he wishes to present himself for examination. The examinations are mainly oral and are conducted in an auditorium so that other students and staff members may attend. The time after the formal course work and clinical laboratories are completed is spent in attending examinations, reading in preparation for examinations, working in the clinics and getting field experience.

Some students from Finland take their clinical years at the Veterinary College of Norway because the clinical buildings are not completed at the Veterinary College of Finland. When the Veterinary College at Helsinki is completed the Finnish students will take all of their training there.

A few students from Iceland, Israel and Hungary also attend the Veterinary College of Norway.

The language of instruction is Norwegian but many of the text books and reference books are in the English or German languages. Books in the English language such as Merchant and Packer's Bacteriology," Jones' "Pharmacology," Dukes' "Physiology" and Sisson and Grossman's "Anatomy" are used extensively. Ellenburger and Baum's "Anatomy" is used as well as other German text books.

After graduation the veterinary surgeon may practice and his professional title is veterinarian. A qualified veterinary surgeon may acquire a degree of Doctor of Veterinary Medicine by writing a thesis which he presents at a public disputation in the college. This requires several years of work. The doctors degree is taken by aspirants for professorships or other teaching positions at the college or by persons who intend to become research workers. A practicing veterinarian is not required to have a doctors degree.

Institute of Reproductive Physiology and Pathology

Reproductive problems and artificial insemination make up a very important part of veterinary practice in Scandinavia. For this reason this area is emphasized in the teaching and research program of the Veterinary College. The Institute of Reproductive Physiology and Pathology (Fig. 2) is headed by Professor Otto Garm. An active teaching program is carried out covering the subjects of rectal palpation, functional infertility, artificial insemination and infectious diseases of reproduction. There is a professional staff of 8 veterinarians and 11 technicians and animal care personnel. The research program is carried out primarily in four different areas of approach: (1) infectious agents which affect reproduction, (2) endocrinology, (3) cyto-genetics, histology and histochemistry, and (4) artificial insemination.

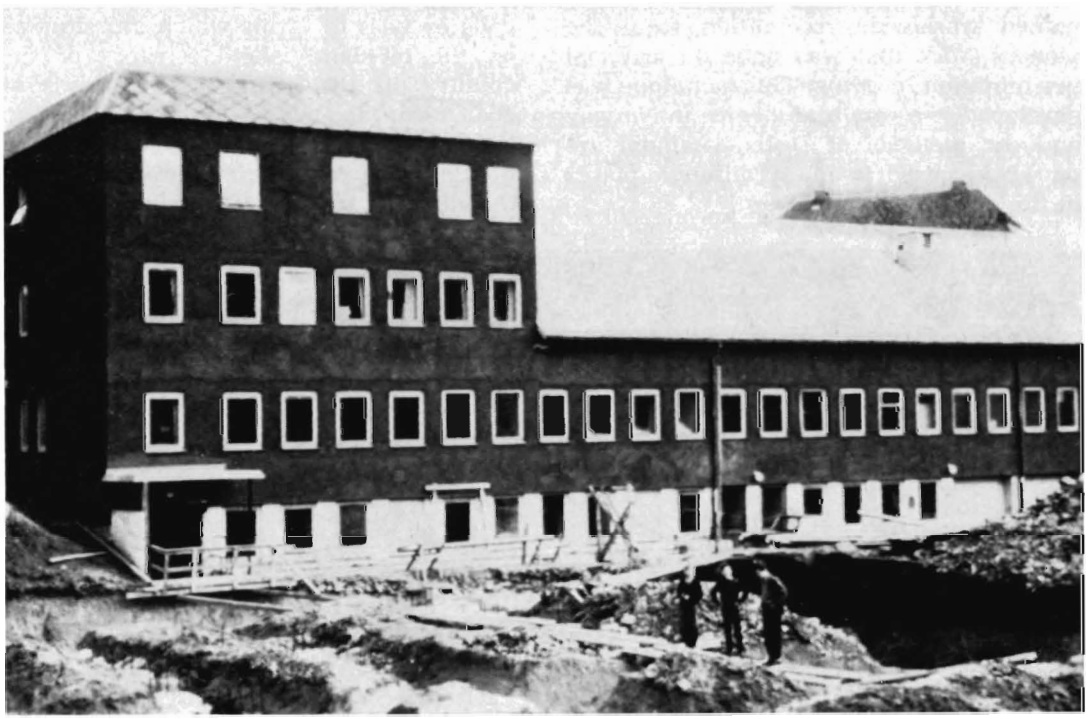

Fig. 2. Institute of Reproductive Physiology and Pathology. The excavation is for a new bacteriology building that is under construction.

The successful program which was launched in 1951 against genital vibriosis in cattle in Norway by Professor Garm has been followed by a control program which has essentially eliminated the disease. The recent outbreak of this disease was quickly detected and control measures are being taken to eliminate the disease completely. Also investigations have been made into the problems of vibrionic abortion in sheep and viral abortion in horses.

The endocrinology group has done some remarkable work in the field of characterizing the steroidal hormones of the ovary and have developed an accurate pregnancy test for swine which is based on the appearance of high concentrations of estrogens in the urine about 27 days after conception.

In the areas of cyto-genetics and histology attention is being centered on the genetic causes of infertility, intersexuality and cystic ovaries. Fundamental histological work on the estrous cycle of the female and spermatogenesis in the male is being coordinated with the studies in endocrinology.

The artificial insemination group has gained worldwide recognition from the pioneer work that was done on artificial insemination in swine. This technique was developed to a very high degree in Norway and the methods of Docent Aamdal are now being used in many different places in the world.

Veterinary Practice

The system of socialized medicine in Norway extends into the veterinary profession. The country is divided into districts and each has a district veterinarian. This veterinarian in many cases is provided a home and office at a reasonable rental by the government and is paid a salary which will enable him to live even if he doesn't have very much practice. He is responsible for providing veterinary service, artificial insemination, reporting disease outbreaks and enforcing quarantine control laws and eradication programs in his district. By means of this district method, veterinary service is available to some of the outlying mountainous and coastal areas where the livestock population is not high. The district veterinarian is paid by the farmer for his treatment of sick animals but the government pays the travel expenses which vary depending on the distance of the farm from the district veterinarian's center of operation. In this way the farmers who live a great distance from the veterinarian are not penalized financially. Some veterinarians in coastal areas make as high as one-third of their calls by boat to farms which are situated on the off-shore island territory of the country off the west coast. In areas of good farm land where the livestock population is high there may be many practitioners who conduct their practice within the districts of the official veterinarians.

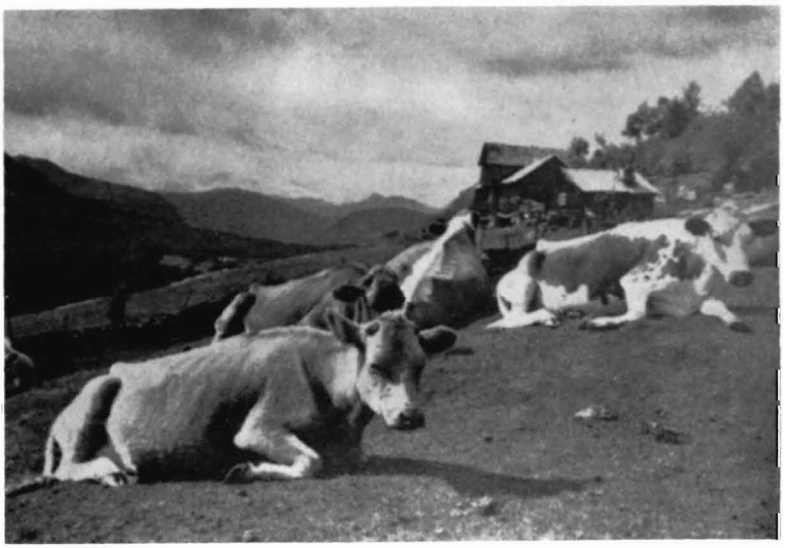

Fig. 3. Native cattle in mountain pasture area of Norway.

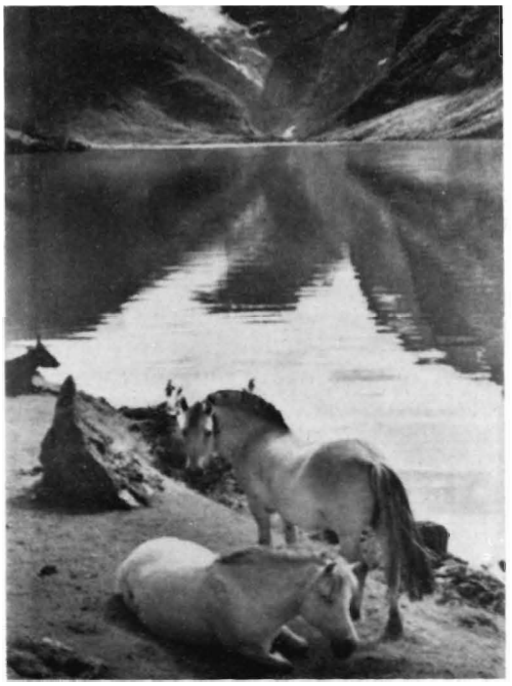

Fig. 4. The Norwegian Fjord horse.

The farmers are free to call whichever one they choose.

Cattle practice makes up an important part of the general practitioner's activity. The native breeds of cattle (Fig. 3) are generally dual purpose animals which are used for meat when they are no longer useful for dairy purposes. There is still some horse practice. The small buckskin-colored Norwegian Fjord horse (Fig. 4) is used extensively in a one-horse hitch for plowing, planting, cultivating and harvesting. Some larger draft breeds are also used. Farm horses are rapidly being replaced by small tractors. Race horse and pleasure horse practice is increasing in the Oslo area. There are many sheep (Fig. 5) and goats in the mountainous regions, but they require very little attention in veterinary practice. Artificial insemination is used in sheep to a great extent in some areas. Swine production is increasing and many horse barns are being converted into pig houses. Swine are kept inside to a large extent and seldom are seen out on pasture or in lots. Some piggeries are being developed which produce pigs systematically on a year-round basis but the swine are largely kept in very small herds with only 3 or 4 breeding sows on a farm. This situation is very well adapted to the use of artificial insemination. The reindeer of northern Norway are used for meat animals. There are great herds of reindeer grazing on the tundra north of the arctic circle in Lapland. The reindeer are essentially domesticated and are owned by the Nomadic Lapps. (Fig. 6) In Norway small animal practice is a specialty which is highly developed only in the larger cities.

Obstetrics, infertility, artificial insemination, metabolic diseases, mastitis treatment and surgery make up the greatest part of veterinary practice in Norway. Vaccination is not used. Due to the isolation of the Scandinavian peninsula and the strict control on importing animals the

Fig. 5. Sheep in the mountains of Norway.

stamping-out technique has been successful in eradicating foot-and-mouth disease, brucellosis, vibriosis, hog cholera, African swine fever and tuberculosis without the use of a vaccination program. The livestock population is remarkably healthy and free from infectious diseases. Rabies does not exist. There is no condition comparable to shipping fever. There is, however, a mastitis problem which is comparable to the problems we have in the United States.

Fig. 6. Nomadic Laplanders and reindeer in the extreme northern part of Norway. Reindeer are an important meat producing animal in Norway.

The reason for the healthy condition of animals in Norway must be related to the low animal population and the lack of traffic and movement of animals throughout the country. Also, the herds are small and in many cases the animals are pastured in mountain regions where the pasture is lush and plentiful. When stabled the animals receive a great deal of individual attention and the stables are kept in a very sanitary and hygienic manner.

The patron saint of the veterinary profession in Norway is St. Blasius who was the bishop of Sebaste in Asia Minor and protested against cruelty to animals and inhumane methods of slaughter. He had injured wild animals brought to him for treatment and nursing care. St. Blasius was martyred on February 3 in the year 316. He is said to have been torn with woolcombers' irons before he was beheaded and this seems to be the reason for his becoming the patron saint of woolcombers. There have been other men in history by the name of Blasius who have been identified with kindness to animals and concern for their health and welfare. St. Blasius is pictured as a robed figure standing before a reindeer (symbolizing the animal population of Norway) which is looking to him for aid and assistance (Fig. 7). At the graduation dinner and celebration which is carried out for each group of new veterinarians St. Blasius comes to life, and during a very serious, solemn and impressive ceremony the graduating men pledge themselves to St. Blasius and dedicate themeslves to the aims of alleviating suffering and eliminating disease in the animal popualtion of Norway.

Fig. 7. Saint Blasius, the patron saint of the Veterinary Profession of Norway.